Claim Listing

Claims 1-56 (cancelled)

Claim 57 (new): A multiple fiber-optic apparatus comprising:

a first strip of side-by-side, side-polished, fiber-optic half-couplers fabricated on a common surface of a first substrate;

a second strip of side-by-side, side-polished, fiber-optic half-couplers fabricated on a common surface of a second substrate;

wherein at least two of the half-couplers in the second strip are formed along a common connectorless and spliceless segment of a first fiber; and

wherein said first and second strips are bonded together forming an array of fiber-optic devices.

Claim 58 (new): The multiple fiber-optic apparatus as in claim 57, wherein at least one of said fiber-optic devices is a 4-port device.

Claim 59 (new): The multiple fiber-optic apparatus as in claim 58, wherein at least one of said fiber-optic devices is one of the group consisting of a coupler, an optical pass-through, an attenuator, a filter, a polarizer, a tap, a splitter, a joiner, modulator, an add-drop multiplexer, an add-drop demultiplexer, and a switch.

Claim 60 (new): The multiple fiber-optic apparatus as in claim 57, wherein said segment of the first fiber loops from one of said fiber-optic devices to another.

Claim 61 (new): The multiple fiber-optic apparatus as in claim 57 wherein said first fiber is routed to provide a respective side-polished region forming each of at least some of the multiple half-couplers along both said first and second strips.

Claim 62 (new): The multiple fiber-optic apparatus as in claim 57 wherein said first fiber is routed by way of cyclical loops to provide a respective side-polished region forming each of at least some of the multiple half-couplers along said second strip.

Claim 63 (new): The multiple fiber-optic apparatus as in claim 58, wherein a complicated optical circuit is formed by way of fiber routings between said multiple fiber-optic devices.

Claim 64 (new): The multiple fiber-optic apparatus as in claim 62 wherein an optical circuit is formed that at least functions partly as one of the group consisting of a many-to-one power combiner and a one-to-many power splitter.

Claim 65 (new): The multiple fiber-optic apparatus as in claim 62 wherein a respective wavelength-selective grating is located within each of some of the couplers formed by the first and second strips, wherein an optical circuit is formed that at least functions partly as one of the group consisting of a multi-channel optical add-drop multiplexer and a multi-channel optical add-drop de-multiplexer.

Claim 66 (new): The multiple fiber-optic apparatus as in claim 62 wherein said loops lie close to a common plane; whereby said apparatus is compact and easily stackable.

Claim 67 (new): The multiple fiber-optic apparatus as in claim 57, further comprising UV-cured bonding material used to secure at least some of the side-polished fiber-optic half-couplers of said first strip to some of the side-polished fiber-optic half-couplers of said second strip.

Claim 68 (new): The multiple fiber-optic apparatus as in claim 57, further comprising UV-cured bonding material securing at least a portion of said first strip to at least a portion of said second strip.

Claim 69 (new): The first multiple fiber-optic apparatus as in claim 57, further comprising at least a second similar apparatus stacked on the first; whereby the result is a three-dimensional array of fiber-optic devices, wherein at least one pair of said devices of the first apparatus are optically connected by a fiber free of connectors and splices.

Claim 70 (new): The multiple fiber-optic apparatus as in claim 57, wherein said segment of the first fiber is a polarization-maintaining fiber.

Claim 71 (new): The multiple fiber-optic apparatus as in claim 60, wherein a loop diameter of said first fiber lies in the range between 3 centimeters and 1 meter.

Claim 72 (new): A multiple fiber-optic apparatus, comprising:

at least two segments of a length of optical fiber;

a substrate supporting said segments;

a region of planar side-polish on each of said fiber segments, wherein each said region has a maximum dimension;

wherein said segments are oriented parallel to one another defining a direction of parallelism;

wherein said regions lie in a common plane;

wherein a locus of said regions define a line perpendicular to said direction of parallelism; and

wherein said length of optical fiber is free of breaks, connectors, and splices.

Claim 73 (new): The multiple fiber-optic apparatus of claim 72, further comprising a side-by-side array of parallel grooves on a surface of said substrate, wherein said regions lie within said grooves.

Claim 74 (new): The multiple fiber-optic apparatus of claim 73, wherein said optical fiber is directed along its length in opposite directions through said two segments relative to said array.

Claim 75 (new): The multiple fiber-optic apparatus of claim 73, wherein said optical fiber is directed along its length in the same direction through said two segments relative to said array.

Claim 76 (new): The multiple fiber-optic apparatus of claim 73, wherein said grooves of said array have a spacing which is smaller than the largest said dimension.

Claim 77 (new): A multiple fiber-optic apparatus, comprising:

multiple coplanar areas of side-polish spaced apart by at least a minimum distance along an unbroken fiber-optic fiber, wherein said areas are each at least approximately elliptical in shape having both a long and a short axis and a dimensional length along each said axis, and wherein said areas are aligned side-by-side in a row with said long axes parallel to one another; and

a common substrate supporting said fiber near each of said areas.

Claim 78 (new): The multiple fiber-optic apparatus of claim 77, wherein said long axes are incrementally spaced apart in said row by distances smaller than the smallest of said long axes.

Claim 79 (new): The multiple fiber-optic apparatus of claim 77, wherein said long axes are incrementally spaced apart in said row by distances smaller than 5 millimeters.

Claim 80 (new): The multiple fiber-optic apparatus of claim 77, wherein said minimum distance is greater than 10 centimeters.

Claim 81 (new): A multiple fiber-optic apparatus, comprising:

multiple bonding regions spaced apart along an unbroken fiber-optic fiber, wherein said fiber is side-polished near at least some of said regions;

a substrate supporting said fiber at said regions;

wherein said regions are aligned side-by-side in a row each spaced from at least one other by a distance of less than 5 millimeter.

Claim 82 (new): A supporting substrate for at least one side-polished fiber, comprising:

a supporting substrate having a surface containing a parallel set of grooves;

a fiber containing at least a pair of side-polished regions each supported in a separate one of said grooves;

an unbroken segment of said fiber routed along a path not entirely supported by said substrate and optically and physically, seamlessly interconnecting said pair.

Claim 83 (new): The supporting substrate of claim 82, wherein said path of said unbroken segment of said fiber extends remotely a distance away from said substrate and then back again.

Claim 84 (new): The supporting substrate of claim 83, wherein said distance is greater than 3 centimeters.

Claim 85 (new): The supporting substrate of claim 83, wherein said substrate has a maximum length dimension that is smaller than said distance.

Claim 86 (new): A multiple fiber-optic apparatus made by steps comprising:

etching grooves into a surface of a substrate, wherein a set of grooves is defined;

bonding portions of at least one fiber to be partially recessed into at least two of said grooves, wherein protruding portions of said fiber lie above said surface, and wherein an unbonded portion of said fiber exists between said two grooves;

constraining said unbonded portion in a space away from said surface; and

polishing said protruding portions down to said surface, wherein regions of side-polish are simultaneously created on said fiber.

Claim 87 (new): The multiple fiber-optic apparatus of claim 86, wherein said constraining step includes preventing said unbonded portion of said fiber from damage during said polishing.